

REMARKS

Claims 37-39 and 41 have been amended. Claims 37-45 are pending in this application.

The Office Action states that the drawings are objected to by the PTO Draftsperson and that formal drawings will be required when the application is allowed. Applicant respectfully submits that formal drawings be deferred until receipt of a Notice of Allowance.

Claims 37, 38, 39, 41, 42 and 43 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Baum et al. (U.S. Patent No. 5,783,716) ("Baum"). The rejection is respectfully traversed.

The present invention relates to integrated circuits having a continuous platinum based metal film with good step coverage. The present invention employs bubbling a non-reactive gas over an organic platinum based metal precursor until the non-reactive gas is saturated with the precursor. The platinum based metal film is then deposited onto a substrate in a CVD deposition chamber in the presence of both oxygen and nitrous oxide at a combined flow rate in the range of about 1500 sccm to about 2500 sccm, and under a pressure of from about 10 to about 1000 Torr. The resulting film is consistently smooth and has good step coverage. The present invention overcomes the drawbacks of the conventional methods by providing a smooth, uniform, continuous film of a platinum group metal that also has good step coverage.

Independent amended claim 37 recites "a capacitor" comprising first and second electrodes having "a dielectric provided between said electrodes" and "wherein at least one of said first and second electrodes is formed of a continuous platinum group metal formed in the presence of both oxygen and nitrous oxide at a predetermined ratio with a combined

flow rate in the range of about 1500 sccm to about 2500 sccm.” Independent amended claim 41 recites a capacitor comprising “a first electrode and a second electrode,” a “dielectric provided between said electrodes” and “wherein at least one of said first and second electrodes is a smooth and continuous platinum electrode formed by depositing platinum in a CVD deposition chamber in the presence of both oxygen and nitrous oxide and at a pressure of from about 10 to about 1000 Torr.” Furthermore, dependent amended claim 38 also includes the limitation that “at least one of said first and second electrodes is formed of a material selected from the group consisting of Ru, Rh, Pd, Os, Ir and Pt.” Dependent claims 42 and 43 further recite a temperature of “from about 250°C to about 300°C,” as well as a pressure of “from about 15 to about 30 Torr.”

Baum does not disclose the limitations of the claimed invention. Baum relates to a liquid delivery for the transport of a platinum source reagent to a CVD reactor using a source reagent liquid solution which is volatilized to provide a vapor phase platinum source material for subsequent deposition from the vapor in the CVD reactor of platinum. Baum recites that the liquid solution precursor optionally in the presence of an oxidizing gas such as oxygen, ozone, nitrous oxide and mixtures thereof in a platinum CVD deposition process. (Col. 5, lines 16-27).

In its examples, Baum refers to the formation of films that could be used as an electrode for DRAM applications. (Col. 8, lines 22-24). Baum does not disclose, however, a “capacitor comprising a first electrode and a second electrode,” “wherein at least one of said first and second electrodes is formed of a continuous platinum group metal formed in the presence of both oxygen and nitrous oxide at a predetermined ratio with a combined flow rate in the range of about 1500 sccm to about 2500 sccm,” as independent amended claim 37 recites. Baum does not disclose a “capacitor comprising a first electrode and a second electrode,” “wherein at least one of said first and second electrodes is a smooth and continuous platinum electrode formed by depositing platinum in a CVD deposition chamber in the presence of both oxygen and nitrous oxide and at a pressure of from about 10 to about 1000 Torr,” as amended independent claim 41 recites. Further,

Baum is silent as to the use of Ru, Rh, Pd, Os or Ir as the material of choice for the capacitor electrode. Accordingly, Baum does not disclose the limitations of the claimed invention and the present invention is not anticipated under 35 U.S.C. § 102(a).

Claims 44 and 45 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Baum et al. (U.S. Patent No. 5,783,716) ("Baum"). The rejection is respectfully traversed.

Independent amended claim 41 recites "capacitor comprising a first electrode and a second electrode," "wherein at least one of said first and second electrodes is a smooth and continuous platinum electrode formed by depositing platinum in a CVD deposition chamber in the presence of both oxygen and nitrous oxide and at a pressure of from about 10 to about 1000 Torr." Dependent claim 44 further recites that the "platinum electrode is the lower electrode" and dependent claim 45 limits the thickness of the platinum lower electrode to "about 500 angstroms."

Baum is silent to the formation of a "capacitor comprising a first electrode and a second electrode," "wherein at least one of said first and second electrodes is a smooth and continuous platinum electrode formed by depositing platinum in a CVD deposition chamber in the presence of both oxygen and nitrous oxide and at a pressure of from about 10 to about 1000 Torr," as independent claim 41 recites, or to the dimensions and qualities of the platinum electrode formed at such operating condition. Baum is also silent as to a platinum electrode as a lower capacitor electrode.

To overcome this shortcomings, the Office Action states that "the capacitor having both upper and lower capacitor electrode being formed of platinum is well known and convention (sic)." Office Action at 4. The Office Action then concludes that "it would have been obvious to one of ordinary skill in the art to form the platinum electrode as a lower capacitor electrode." *Id.* However, there is nothing in Baum to disclose or suggest that the platinum electrode is formed at a pressure of from 10 to about 1000 Torr, as recited in independent claim 41, as amended. Baum does not disclose or suggest "a

smooth and continuous platinum electrode” as forming at least one of the first and second capacitor electrodes, as independent amended claim 41, or a platinum electrode formed at a pressure of from 10 to about 1000 Torr and having a thickness of about 500 angstroms, as claim 45 recites. Thus, Baum does not disclose or suggest the limitations of claims 44 and 45, and these claims are patentable over Baum.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

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Respectfully submitted,

By 

Thomas J. D'Amico

Registration No.: 28,371

DICKSTEIN SHAPIRO MORIN &

OSHINSKY LLP

2101 L Street NW

Washington, DC 20037-1526

(202) 785-9700

Attorney for Applicant